AMENDMENTS TO THE ABSTRACT

Abstract

A system for calculating fast Fourier transforms includes a non-final stage calculating ~~means~~ element for repetitively performing in-place butterfly calculations for n-1 stages as well as a final stage calculating ~~means~~ element for performing a final stage of butterfly calculations. The final stage ~~calculating means~~ calculation includes a first loop and a second loop. The first loop performs a portion of the final stage butterfly calculations ~~by iterating on a table of first loop index values consisting of values that bit-reverse into themselves. The first loop also~~ and includes control logic to ~~select inputs for groups of butterfly calculations based on the first loop index values, to~~ perform groups of butterfly calculations~~,~~ and to store the butterfly calculation outputs in a shuffled order in place of the ~~selected~~ inputs to result in a correct ordering of transform outputs. The second loop performs a remaining portion of the final stage butterfly calculations and ~~by iterating on a table of second loop index value pairs consisting of two values that bit-reverse into each other. The second loop~~ includes control logic to ~~select inputs for two groups of butterfly calculations based on the two second loop index pair values respectively, to~~ perform ~~two groups of~~ butterfly calculations~~,~~ and to store the butterfly calculation outputs ~~from a first one of the two groups butterfly calculations~~ in a shuffled order in place of the inputs ~~selected for a second one of the two groups of butterfly calculations and storing butterfly calculation outputs from the second one of the two groups of butterfly calculations in shuffled order in place of the inputs selected for the first one of the two groups of butterfly calculations~~ to result in a correct ordering of transform outputs. ~~Methods are also provided.~~